

The African Organisation for Standardisation

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ARS 933 (2012) (English): African leafy vegetables -- Specification



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African leafy vegetables — Specification



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Foreword

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This African Standard was prepared by the ARSO Technical Harmonization Committee on Agriculture and Food Products (ARSO/THC 1).

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ARSO Central Secretariat
International House 3rd Floor
P. O. Box 57363 — 00200 City Square
NAIROBI, KENYA

Tel. +254-20-224561, +254-20-311641, +254-20-311608

Fax: +254-20-218792

E-mail: arso@arso-oran.org

Web: www.arso-oran.org

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ARSO Central Secretariat
International House 3rd Floor
P.O. Box 57363 — 00200 City Square
NAIROBI, KENYA

Tel: +254-20-224561, +254-20-311641, +254-20-311608
Fax: +254-20-218792

E-mail: arso@arso-oran.org
Web: www.arso-oran.org

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Introduction

The increased awareness of the health protecting properties of non-nutrient bio-active compounds found in fruits and vegetables, has directed immense attention to vegetables as vital components of daily diets. The United Nations Food and Agriculture Organization (FAO) has widely noted that most widespread and debilitating nutritional disorders, including birth defects, mental and physical retardation, weakened immune systems, blindness and even death has resulted from poor fruits and vegetables consumption habits. A low intake of vegetables and fruit is among the top ten risk factors contributing to mortality worldwide. The World Health Organization (WHO) recommends a daily intake of more than 400 g of vegetables and fruit per person to protect against diet-related chronic diseases. African Leafy Vegetables (ALVs) though rich in vitamins, minerals and trace elements, over several decades have been recording an ever-diminishing consumption and production trend.

In developing countries, the diets of the poor are predominantly cereal based and nutrient poor, with very little foods of animal origin, vegetables and fruit. A low intake of vegetables and fruit, particularly those rich in provitamin A carotenoids, contributes towards the high prevalence of vitamin A deficiency. For children younger than five years worldwide, an estimated 250 million are vitamin A deficient and, in 2004, an estimated 0.6 million died because of vitamin A deficiency.

Micronutrient supplementation and food fortification are short and medium-term strategies to address the "hidden hunger" (i.e. micronutrient malnutrition), but in the long term dietary diversification through a food-based approach involving agriculture has been proposed as one of the more sustainable options. Dietary diversification has to widen its scope to include indigenous crops, such as African green leafy vegetables. Although concerns with respect to the bioavailability of vitamin A from green leafy vegetables have been raised, consumption of cooked and pureed green leafy vegetables has been shown to have a beneficial effect on improving vitamin A status.

The reawakening of demand for nutrition and health has gradually created an enormous consumer demand for traditional food crops and African indigenous and traditional leafy vegetables thus have a pivotal role in the success of the World Health Organization's (WHO) global initiative on fruits and vegetables consumption in the continent. On the African continent as a whole, production, trade and consumption of indigenous and indigenous African leafy vegetables are expanding.

Available data on the more commonly consumed varieties point to antioxidants containing leafy vegetables that can also provide significant amounts of beta carotene, iron, calcium and zinc to daily diets.

This African Standard is part of the concerted effort to harmonize African Standards with respect to products of special reference to African needs. In this regard, this standard was prepared to harmonize the requirements for African leafy vegetables (ALVs) which have the potential to alleviate nutritional needs for a wide cross-section of African populations as well as facilitating trade and contributing to rural development and poverty alleviation.

African leafy vegetables — Specification

1 Scope

This standard applies to African leafy vegetables of varieties (cultivars) grown from the following species to be supplied fresh to the consumer, African leafy vegetables for industrial processing being excluded:

- (a) Amaranth leaves (*Amaranthus* spp.)
- (b) African nightshades (*Solanum scabrum*, *S. americanum*, *S. villosum*, *Solanum retroflexum* Dun.)
- (c) African cabbage / Spider plant (*Cleome gynandra* L.)
- (d) Leaves of cowpeas (*Vigna unguiculata*(L.) Walp.)
- (e) Blackjack (*Biddens pilosa*, *B. Bitermata*)
- (f) Jute leaves (Jew's Mallow) (Mallow leaves) *Corchorus tridens*
- (g) Lamb's quarter (*Chenopodium album* L.)
- (h) Tackweed (*Tribulus terrestris*)
- (i) Pumpkin leaves (*Cucurbita maxima*)
- (j) African spinach (*Basella alba* L.)

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ARS 53, *General principles of food hygiene — Code of practice*

ARS 56, *Prepackaged foods — Labelling*

CAC/GL 21, *Principles for the establishment and application of microbiological criteria for foods*

CAC/RCP 44, *Recommended international code of practice for the packaging and transport of tropical fresh fruits and vegetables*

CAC/RCP 53, *Code of hygienic practice for fresh fruits and vegetables*

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

ISO 874, *Fresh fruits and vegetables — Sampling*

ISO 2169, *Fruits and vegetables — Physical conditions in cold stores — Definitions and measurement*

ISO 6561-1, *Fruits, vegetables and derived products — Determination of cadmium content — Part 1: Method using graphite furnace atomic absorption spectrometry*

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ISO 6561-2, *Fruits, vegetables and derived products — Determination of cadmium content — Part 2: Method using flame atomic absorption spectrometry*

ISO 6633, *Fruits, vegetables and derived products — Determination of lead content — Flameless atomic absorption spectrometric method*

ISO 6634, *Fruits, vegetables and derived products — Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method*

ISO 6637, *Fruits, vegetables and derived products — Determination of mercury content — Flameless atomic absorption method*

ISO 7563, *Fresh fruits and vegetables — Vocabulary*

ISO 7952, *Fruits, vegetables and derived products — Determination of copper content — Method using flame atomic absorption spectrometry*

ISO 9526, *Fruits, vegetables and derived products — Determination of iron content by flame atomic absorption spectrometry*

ISO 17239, *Fruits, vegetables and derived products — Determination of arsenic content — Method using hydride generation atomic absorption spectrometry*

3 Definitions

For the purposes of this standard, the terms and definitions in ISO 7563, and the following terms and definitions apply.

3.1

blemish

any physical injury affecting the surface of the produce, such as scars, healed cracks and discoloured spots, which detracts from its natural appearance, but will not significantly affect its shelf life

3.2

clean (visual) produce

free from adhering soil, insects, chemical deposits and other foreign matter

3.3

damage

any defect or combination of defects of physical or physiological (external or internal) causes which detracts from the edible or marketing quality of the produce

3.4

disease

any defect or combination of defects caused by micro-organisms

3.5

fairly well shaped

85% of the produce has the shape characteristic of the variety

3.6

firm

not soft, shrivelled or spongy

3.7

fresh

the produce maintains its reaped appearance and is not shrivelled or shows signs of dehydration

3.8**mature**

stage of maturity that allows the produce to possess the necessary quality characteristics that is desired by the consumer

3.9**serious damage**

any defect or combination of defects of physiological or physical (external or internal) causes which could lead to the abnormally quick deterioration of the produce and causes rejection

3.10**similar varietal characteristics**

fresh produce in a container shall have the same general shape, colour characteristic of skin and flesh

3.11**smooth**

the produce is free from any defect(s) causing roughness which more than slightly detracts from its general appearance

3.12**well-shaped**

produce has the shape characteristic of the variety

4 Provisions concerning quality**4.1 General**

The purpose of the standard is to define the quality requirements for African leafy vegetables at the export-control stage after preparation and packaging.

However, if applied at stages following export, products may show in relation to the requirements of the standard:

- (a) a slight lack of freshness and turgidity
- (b) a slight deterioration due to their development and their tendency to perish.

The holder/seller of products may not display such products or offer them for sale, or deliver or market them in any manner other than in conformity with this standard. The holder/seller shall be responsible for observing such conformity.

4.2 Minimum requirements

4.2.1 In all classes, subject to the special provisions for each class and the tolerances allowed, the African leafy vegetables must be:

- (a) intact; African leafy vegetables may be presented as single leaves or as rosettes; when presented as rosettes the outer leaves and roots may be removed
- (b) sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded
- (c) clean, practically free of any visible foreign matter; however, unwashed leafy vegetables (if indicated) may have traces of earth or other growing material
- (d) practically free from pests
- (e) practically free from damage caused by pests

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- (f) fresh in appearance and turgescence
- (g) free of abnormal external moisture
- (h) free of any foreign smell and/or taste.

4.2.2 The development and condition of the leafy vegetables must be such as to enable them:

- (a) to withstand transportation and handling
- (b) to arrive in satisfactory condition at the place of destination.

4.3 Classification

African leafy vegetables are classified in two classes, as defined below:

4.3.1 Class I

African leafy vegetables in this class must be of good quality. They must be characteristic of the variety and/or commercial type.

African leafy vegetables presented in rosettes must be trimmed. The roots must be cut underneath the rosette. The produce must be free from root tufts.

The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package:

- (a) slightly damaged leaves, such as cracks, holes or tears
- (b) slight defects in colouring.

4.3.2 Class II

This class includes African leafy vegetables that do not qualify for inclusion in Class I but satisfy the minimum requirements specified above.

African leafy vegetables presented in rosettes may be untrimmed.

The following defects may be allowed, provided the African leafy vegetables retain their essential characteristics as regards the quality, the keeping quality and presentation:

- (a) damaged leaves, such as cracks, bruises, holes or tears
- (b) defects in colouring
- (c) slight lack of freshness
- (d) small root tufts
- (e) slight ribbiness.

5 Provisions concerning sizing

There is no sizing requirement for African leafy vegetables.

6 Provisions concerning tolerances

At all marketing stages, tolerances in respect of quality shall be allowed in each lot for produce not satisfying the requirements of the class indicated.

6.1 Quality tolerances

6.1.1 Class I

A total tolerance of 10 per cent, by weight, of African leafy vegetables not satisfying the requirements of the class but meeting those of Class II is allowed. Within this tolerance not more than 1 per cent in total may consist of produce satisfying neither the requirements of Class II quality nor the minimum requirements, or of produce affected by decay. In addition, 10 per cent, by weight, of single leaves are allowed when presented as rosettes.

6.1.2 Class II

A total tolerance of 10 per cent, by weight, of African leafy vegetables satisfying neither the requirements of the class nor the minimum requirements is allowed. Within this tolerance not more than 2 per cent in total may consist of produce affected by decay. In addition, 20 per cent, by weight, of single leaves is allowed when presented as rosettes.

7 Provisions concerning presentation

7.1 Uniformity

The contents of each package must be uniform and contain only African leafy vegetables of the same origin, variety or commercial type and quality.

In Class I, African leafy vegetables must be uniform in shape and colour.

However, a mixture of African leafy vegetables of distinctly different species may be packed together in a sales package, provided they are uniform in quality and, for each species concerned, in origin.

The visible part of the contents of the package must be representative of the entire contents.

7.2 Packaging

African leafy vegetables must be packed in such a way as to protect the produce properly.

The materials used inside the package must be clean and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications, is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Packages must be free of all foreign matter.

8 Marking and labelling

8.1 Consumer packages

In addition to the requirements of ARS 56, the following specific provisions apply:

8.1.1 Nature of produce

- (a) "Amaranth leaves"; "African nightshades"; "African cabbage"; "Spider plant"; "Cowpea leaves"; "Blackjack"; "Jew's Mallow"; "Lamb's quarter"; "Tackweed"; "Pumpkin leaves" if the contents are not visible from the outside
- (b) "Mixture of African leafy vegetables", or equivalent denomination, in the case of a mixture of leafy vegetables of distinctly different species.

8.1.2 Consumer information

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- (a) Class
- (b) "Unwashed", where appropriate
- (c) "Wash before use" (optional).

8.2 Non-retail containers

Each package¹ must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside:

8.2.1 Identification

The exporter, packer and/or dispatcher shall be identified by name and physical address (e.g. street/city/region/postal code and, if different from the country of origin, the country) or a code mark officially recognized by the national authority.²

8.2.2 Nature of produce

- (a) "Amaranth leaves"; "African nightshades"; "African cabbage"; "Spider plant"; "Cowpea leaves"; "Blackjack"; "Jew's Mallow"; "Lamb's quarter"; "Tackweed"; "Pumpkin leaves" if the contents are not visible from the outside
- (b) "Mixture of African leafy vegetables", or equivalent denomination, in the case of a mixture of leafy vegetables of distinctly different species.

8.2.3 Origin of produce

Country of origin and, optionally, district where grown or national, regional or local place name.

8.2.4 Commercial specifications

- (a) Class
- (b) "Unwashed", where appropriate
- (c) "Wash before use" (optional).

8.2.5 Official control mark (optional)

9 Contaminants

9.1 Pesticide residues

African leafy vegetables shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

9.2 Other contaminants

African leafy vegetables shall comply with those maximum levels for contaminants established by the Codex Alimentarius Commission for this commodity.

¹ Package units of produce prepacked for direct sale to the consumer shall not be subject to these marking provisions but shall conform to the national requirements. However, the markings referred to shall in any event be shown on the transport packaging containing such package units.

² The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark, and the code mark should be preceded by the ISO 3166 (alpha) country/area code of the recognizing country, if not the country of origin.

10 Hygiene

10.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of ARS 53, CAC/RCP 53, and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

10.2 The produce should comply with any microbiological criteria established in accordance with CAC/GL 21.



Blackjack (*Bidens pilosa*)



Bidens biternata



Jute leaves (Jew's Mallow) (Mallow leaves) *Corchorus tridens* L.



Jute leaves (Jew's Mallow) (Mallow leaves) ***Corchorus tridens* L.**



Lamb's quarter (*Chenopodium album* L.)



Lamb's quarter (*Chenopodium album* L.)



Tackweed (*Tribulus terrestris*)



Tackweed (*Tribulus terrestris*)

Bibliography

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